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ABSTRACT

What is actually happening in courses of different sizes and what effect (if any) is class size having on student and teacher perceptions of what occurs? Data were collected by comparing what happened in a small class with what happened in a larger class taught by the same teacher. Tables cover: (1) classes in the study; (2) variables and information sources; (3) teacher time spent in various activities; (4) activities in classes; (5) mean responses to core items on course evaluation form; (6) correlations of course evaluation data; and (7) teacher logs. Some findings are: (1) in actual practice there seem to be few differences between large and small classes; and (2) large classes were 400 percent more productive than the small classes in terms of student credit-hour generation at a cost of only 40 percent increase in faculty time spent. Balancing class size by having every student enroll in a multi-pattern of at least one small and one large class was found to be possibly productive for the institution. (Author/KE)

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CLASS SIZE AND COLLEGE TEACHING: DOES IT REALLY MAKE ANY DIFFERENCE?

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A report summarizing first year activities of Project IV: A Multi-patterned Learning Schedule --one of the Projects in Academic Productivity at the College of Saint Benedict funded by a Hill Family Foundation Grant.

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PREFACE

The original proposal for this project called for an investigation of the effects of manipulating class size on students, faculty and institutional productivity. The proposal presented a complex hypothesis: By providing each student with a class schedule of varying sized classes (at least one very large class and at least one small class per student per semester), the student would derive educational benefits and maintain feelings of community in learning consistent with the College of Saint Benedict's goals and traditions. Such scheduling could facilitate making teaching load requirements as a function of student credit hours generated. Instructional productivity then could be increased by increasing the required number of credit hours produced by each faculty member. If these manipulations were to be made sensibly, then students would actually find their educational program improved while the college would find its cost of instruction slightly reduced.

We (Tom Peterson, Michal Clark and Al Davisson) felt that this was certainly an interesting idea. We immediately began to examine available educational literature on effects of class size on student learning. We found the literature to be very confusing. Some studies indicate that class size makes no difference. Others indicate that small classes are more desirable.

Still others indicate that large classes are more desirable. The amazing thing is that the literature is virtually bereft of any fundamental, descriptive data on what actually goes on in college classrooms. Based upon the enigmatic guidance which we received from the literature, we agreed that the original proposal statement was simultaneously too ambiguous and too ambitious to bear fruitful results. The judgment was also supported by the political and administrative difficulties demanded by directly manipulating class size for a significant number of faculty and students and carrying out the study during one academic year.

As a result of these considerations we conceptualized a study which could be done during the 1974-75 academic year with the available resources. This study seeks to gather basic descriptive data about what is actually happening in courses of different sizes and what effect (if any) is class size having on student and teacher perceptions of what is happening. The resulting study is described in the following report and the study has led us to recommendations about the manipulation and/or control of class size as it effects students, faculty and institutional productivity.

In preparing this study and report, we would like to thank the following people for their cooperation and contributions: Al Davisson, Tom Peterson, Angie Dufner, Sr. Cecelia Prokosch, Sr. Jeremy Hall, Sr. Emeric Weber and Vera Theisen who gave us access to their classes and provided us with data; Al Davisson, who was instrumental in the design of the study; Susan-Oda Knese,

Gloria Sop, Lynne Steely and Mary Wotzka, all of whom have been instrumental in pulling it all together.

CLASS SIZE AND COLLEGE TEACHING: DOES IT REALLY MAKE ANY DIFFERENCE?

If today's liberal arts college is to survive, it must concern itself with productivity. Since the concept of institutional productivity is not yet well defined in liberal arts colleges and since faculty salaries tend to be the largest budgetary item in college budgets, the area of faculty productivity is a rapidly increasing concern. We are not sure what faculty productivity really is. We doubt that we could discriminate between productive and non-productive faculty members in all cases. Yet, we are convinced that most institutions will probably define faculty productivity as some function of number of students taught and served. Obviously, this function will probably not be a simple one, but without question, if an institution could teach the same number of students with fewer number of faculty, the institution would be more productive. This study is an attempt to collect data relevant to making decisions about this approach to increasing institutional productivity.

One of the venerable indices of how many students the average faculty member serves is the student-teacher ratio for the institution. Assuming that the institution can count the number of students (usually easy) and the number of faculty (not nearly so easy when faced with increasing numbers of part-time

teachers, part-time administrators, tenure quotas, etc.), this ratio is still simultaneously deceptive and problematical. The deceptive aspect of the ratio comes from two different directions. First, the ratio is dramatically effected by who one counts as faculty or teachers. Second, in an institution with a student-faculty ratio of about 18:1, most freshman are enrolled in classes with 50 or more students in each class. This situation is indeed problematical for the liberal arts college in that liberal arts colleges typically put great emphasis on their small class sizes as an integral part of the educational product which they market. We feel that the best way to deal with the student-teacher ratio is to ignore it. It seems as though looking at class size is potentially much more useful in terms of decision making about institutional and faculty productivity.

Increasing either the average class size or each class size would obviously "teach more students" without increasing the staff requirements. On the surface this could be indeed appealing to the beleaguered dean who is attempting to balance the overly constrained instructional budget. However, three potential problems emerge immediately. First, the small class size tradition of the liberal arts college is one of the few direct, publicly observable characteristics which differentiate such schools from the state college "diploma mills". Consequently, simply increasing class size could further strain the all too frequently overstrained public relations programs of the liberal arts college. Second, increasing class size could actually be detrimental

to student learning and satisfaction. Third, increasing class size could strongly effect faculty morale, particularly since such increases are never "across the board". Faculty who teach large classes typically "know" that they work harder and do more than faculty who teach small classes.

In light of these potential problems, we have stumbled onto a model for effectively increasing productivity without encountering these general problems. The model is really quite simple. The model calls for each student during each semester to enroll in at least one large class (over 50) and at least one small class (under 18). Simultaneously, faculty could have their loads balanced out so that each faculty could share responsibility for large classes on a reasonable schedule. If this model were implemented, simply unlimiting size on large classes (and hence reducing the number of sections to be offered in many "bread and butter" courses) should guarantee increased productivity. Before advocating implementation of this model or discussing its potential and/or limitations, we need to consider what is known about college class size, and the effects of that variable on students and teachers.

Mouly (1973, p. 320) advocates that ". . .there is no convincing evidence that students necessarily or even generally, suffer from attendence in large classes." His position is consistent with data presented by Siegal et al (1959). Results from studies on class size are quite inconclusive. Herbert A. Thelen (1967) presents a summary of results showing that sometimes large classes are more effective and at other times small

classes are more effective. These findings suggest an interaction between class size and course purpose and teaching strategies. It is intuitively reasonable to think that the large lecture class can be quite effective for transmitting course content while a small discussion class might more effectively develop problem solving abilities, attitudes of inquiry, a sense of a learning community, communications skills, etc. Research findings on this notion are difficult to interpret because all too frequently college teachers teach large or small classes exactly the same way (Danowski, 1965). Obviously, little (in terms of student learning) is to be gained or lost by manipulating class size if small classes are lectured to in the same way a large classes. McKeachie (1968) suggests that instruction should be planned and carried out in a fashion appropriate to the size of the class.

Going back to the model of a multi-patterned enrollment program with respect to class size, it seems reasonable to advocate the try out of the model. By insuring that each student is enrolled in a small class, the small class size claim of the liberal arts college can be upheld with greater verve than ever. (After all it would be nice if each freshman were truly guaranteed a space in a small class each semester.) By insuring that faculty responsibility for large classes would be equitably distributed, faculty morale should not be negatively affected by increasing productivity through unlimiting enrollment in large classes. With respect to student learning and satisfaction, this multi-class sized approach should have little detrimental effect.

In fact if faculty follow McKeachie's suggestion about utilizing instruction appropriate for the class size, the overall quality of teaching and learning might actually improve.

So far, our model sounds too good to be true. So we were forced to ask ourselves the question, "What actually happens in college classes of different sizes?" We found little data in the literature to answer this question. So, we felt it imperative to collect data at the College of Saint Benedict before recommending that the model be adopted. If faculty are already dealing with large and small classes in a manner appropriate to size, then implementation procedures for the model would be very different than if faculty were not. We decided that the two primary questions which we could answer with data would be how do teachers spend the time they devote on a class and what activities occur in a class. Presumably, both the time and activity variables should show a difference between large and small classes.

PROCEDURES

We decided that our best strategy was to limit the study initially to collecting some fundamental, descriptive data. If data on several variables could be collected from several different sized classes, perhaps we could begin making empirical sense out of the class size variable. We adopted a within teacher design for gathering data. We felt that we could get better cooperation from teachers (our colleagues with whom we frequently attend meetings, drink coffee, etc.) if we made com-

parisons of what happened in one teacher's small class with what happened in a larger class taught by the same teacher. We also felt that this comparison of how a teacher deals with two different sized classes would provide more useful information for decision making about teaching load and class size in a small liberal arts college.

Originally we anticipated identifying three sizes of classes: small with about 15 students; medium with about 32 students; and large with over 50 students. As soon as the Spring semester preliminary registration figures (an excellent predictor for Spring class sizes on the campus) became available, those data were thoroughly examined to identify faculty members who would be teaching courses which would fall into two different size categories. Unfortunately only eight faculty members could be identified. Based on the smallness of the total available sample and the projected enrollments for their classes we re-defined the class size variable. We only dealt with two different class sizes: small with under 18 students and large with over 28 students.

All eight of the identified faculty members were contacted. After a series of meetings during which the study and its aims and procedures were discussed, seven of the eight faculty members agreed to participate and provide us with the information that we were requesting. Each of the participating faculty members was given a small stipend for his/her work. Each was teaching a small class and a large class. (Most were also simultaneously teaching a third class to fill their teaching load, but that third class was of no interest for the comparisons to be made.) It is

worth knowing that the one teacher who did not agree to cooperate did so because she knew that she would be off campus a significant proportion of the semester, and someone else would be teaching her classes at that time.

Table 1 presents a summary of the classes used in this study. It is worth noting that the median small class size was 15 while the median large class was 42. Examination of the class size distributions shows that the classes labelled as "large classes" are clearly larger than those labelled as "small classes". The magnitude of difference between large and small is large enough to be meaningful on the liberal arts college campus. Table 1 also shows that the range of courses seems similar for both large and small classes.

Each participating teacher agreed to provide a substantial amount of information on her/his courses. Each teacher kept track of how much time was spent doing each activity relevant to each course. The teacher also kept a frequency tally of all activities students did in class during each course. Teachers kept a log of the perceptions and reactions to each course. Each teacher also provided copies of course materials, evaluations of student performance and access for administration of a course evaluation questionnaire.

Table 2 summarizes the dependent variables of the study and indicates data sources for each. Each of those variables needs to be better defined and the data source better described.

Teacher time is the amount of time a teacher spends in activities (in class and out) for a particular class. Each teacher

TABLE 1
CLASSES IN STUDY

INSTRUCTOR	SMALL CLASS	SIZE	LARGE CLASS	SIZE
A	Child and Adolescent Development	15	Child and Adolescent Development	55
B	Rhetoric	10	World Literature	28
C	Meal Management	4	Food and People	42
D	French 112	12	French 111	30
E	Elementary School Curriculum	17	Children's Literature	67
F	History of Psychology	16	Introductory Psychology	134
G	Jesus/Church	18	Christianity for Adults	36
	TOTAL STUDENTS	92		392
	MEDIAN CLASS SIZE FOR GROUP	15		42

TABLE 2
SUMMARY OF VARIABLES AND INFORMATION SOURCES

VARIABLE	INFORMATION SOURCE
Teacher Time	Weekly Log and Summary Form
Class Activities	Weekly Log and Summary Form
Course Structure	Course Materials and Teacher's Log
Student Performance	Teacher's Log and Grading Information
Student Evaluation of Course	Questionnaire
Teacher Response to Course	Questionnaire and Teacher's Log

was given a set of weekly log forms for recording time spent in various activities. He/she was also given a summary form to fill out giving total time spent each cycle during the semester in each activity. We felt providing the weekly forms would encourage up-to-date record keeping so periodically we attempted to collect weekly forms even though our prime interest was in the summary form. Both a weekly time log form and a summary time log form are attached as Appendix A. (It should be noted that each teacher was provided a complete set of materials for each of her/his classes in a single ring binder. So, while there was a good deal of record keeping required by the study, we did try to keep it to be a reasonable task.)

Class activities are defined as what activities actually occurred in class. Teachers were asked to keep a frequency count of each activity which occurred in class. Again both weekly and summary forms were provided. Samples of both activity forms are attached as Appendix B.

Course structure is defined loosely in the sense of what sort of structure is the teacher imposing on the course. Obviously, our sample size is too small to do anything sophisticated with a course structure variable, but we felt a need to control for this variable. For example if all of the large classes were structured as traditional, lecture courses and if each small course were structured as some non-traditional sort of course, our results would be totally uninterpretable. For this control purpose, course structure can be adequately inferred by examining course materials: syllabi, outlines, lesson plans, etc. The

teacher's log, which contained free-response journal or diary entries, could also provide information on course structure.

Student performance is defined as student performance with respect to some criteria. Initially this variable was of high interest to us. It would be very exciting if student performance (or learning) could be related to class size. However, it is impossible to isolate these two variables for analysis in such a small sample study. Our intent was to measure student performance with a standardized test within each course. The distribution of courses and instructors in our sample forced abandonment of this intent. As a consequence of these two lines of reasoning student performance has become another control variable in the study. Each teacher's grading information was collected to allow determination of whether students in the current course performed on a par with previous offerings of the same course. Again it was important to check the data to make sure that large or small classes did not deviate from one another on this variable.

Student evaluation of the course is defined as student responses to a multiple choice questionnaire. A copy of the questionnaire is attached as Appendix C. The questionnaire was developed by selecting items from the Purdue Cafeteria System for course evaluation. Items were selected to form a broad based instrument. The Purdue Cafeteria System was used for selection since each item has been "debugged". Items 41-45 of the questionnaire form the "Purdue Core" and can be summed to give an overall rating of effectiveness. The five choice response field was used so as to maintain compatibility with our

Datronics (3M) RST 550 Test scoring system with a direct interface into the computer. Students responded to the questionnaire on mark sensed answer forms. Their anonymity was guaranteed and maintained. Teachers were not present when the forms were filled out. The instrument was administered during the second to the last week of the semester.

Once the questionnaires were collected, they were machine scored. The data were transmitted directly into the Hewlett-Packard 2000F computer system at St. John's University. The questionnaire data were processed by the ISI (a questionnaire analysis program) program which is a part of the MSEP package developed in the School of Pharmacy at Ohio State University. It should be noted that any question receiving a "no response" response was not tallied in determining item means. The "no response" column has to be maintained as this present scoring system does not readily accept a blank answer field.

Teacher response to the course is defined as exactly that. We measured this response by asking each teacher to fill out a course evaluation form for each course. A sample of the teacher evaluation questionnaire is attached as Appendix D. The teacher's log provided a case study sort of data which also tells much about his/her response to the course. A sample log form is attached as Appendix E.

Since we were asking each teacher for a good deal of information over a fifteen week period of time, we wanted to be certain that we were available to answer any questions or resolve any uncertainties involving format and mechanics of the data collection.

Each teacher was informed of our availability. In addition we scheduled a meeting once a month at which time we were readily accessible. Since we were seldom contacted and only had an average of one teacher contact us at each monthly meeting, we assume that the teachers found their participation in the study to be manageable. Our positive feelings were increased as we had a secretary and/or student assistant occasionally contact people to assess that there were "no problems". Moreover, we received a large package of data from each participant on schedule.

All of the data were actually obtained by the authors in late May and early June. Log entries were dated appropriately through the semester and a complete set of data was received from each participant. So, while the data are all of a purely descriptive nature and while there are many potential confounding variables and a looseness in the design, the set of data seems to be quite legitimate and should be accepted and believed for what it is -- an honest attempt to gather some descriptive information about what actually goes on in different sized college classes.

The collation and analysis of the data was done with this fundamental assumption about the data in mind. Only descriptive statistics are used and then only sparingly. Some of the more interesting aspects of the data are in the case study information and are not presently suitable for quantification. Obviously with the limiting properties of descriptive data and small sample (only seven pairs of classes) research, little hypothesis testing was done. Nonetheless, the data do lead to some definite results and conclusions.

RESULTS

Our first concern in examining the data was in the control variables. If either course structure or student performance was too different between the large class sample and the small class sample, we would have difficulty in further interpreting the data. Fortunately, such differences do not appear to be present.

The course structure variable was studied by examining course materials and the teacher's logs. One of the large courses was taught using a highly specific model of individualized instruction (a Personalized System of Instruction approach). One small class also used an individualized, modularized approach to instruction. The other six classes in each sample were more or less traditional. Note that the large individualized class and the small individualized class were taught by different instructors. As an unbiased but still subjective way to compare these course materials, a panel of three education students was asked to examine the course materials and course logs from both the large and small class samples. The panel had no difficulty in reaching a consensus that there were no systematic differences between the two samples with respect to course structure. They did observe that some teachers seemed better organized than others, but the two most organized teachers were equally well organized in both large and small classes.

The student performance data was studied by examining teacher's logs and grading information. Also, if such information were not readily apparent, theachers were asked if the performance

of the current group of students differed from past groups in this same or similar classes. In all cases the responses were negative. That is that there were no perceived differences. Consequently, it seems reasonable to assume that the large class sample and small class sample did not differ on either the course structure or student performance control variables. This result combined with our within-teacher design then allows the results on the other dependent variables to be compared directly between the two samples.

Table 3 presents teacher time data. The hours represent a total spent by all seven teachers for the entire semester. It is interesting to note that a traditional formula for computing faculty time commitments (4 units x (50 minutes in class + 100 minutes out of class)/week x 15 weeks/semester) for each faculty member would indicate that about 1,050 hours should be spent teaching the seven classes in each sample in one semester. Looking at the mean amount of time spent by each teacher per week we see that for our sample teaching a large class required 3 hours and 40 minutes more per week than teaching a small class. That indicates that teaching a large class requires about 40% more time than teaching a small class.

The more interesting results in Table 3 seem to be the relative amount (%) of teacher time spent in various course related activities. We note that the proportion of time spent lecturing is very close for each group. The teachers spent relatively more time preparing lectures, doing background reading and correcting papers for their large classes. They spent more time in group activities and collecting materials for their small classes.

TABLE 3
SUMMARY OF TEACHER TIME SPENT IN VARIOUS ACTIVITIES

ACTIVITY	SMALL CLASS HOURS	SMALL CLASS %	LARGE CLASS HOURS	LARGE CLASS %
Lecturing	75:50	8.2	102:45	7.9
Correcting Papers	174:55	18.8	276:30	21.3
Media Presentation	31:45	3.4	12:15	.9
Talking with Students	162:25	17.5	237:40	18.3
Group Activities	78:55	8.5	76:30	5.9
Laboratory Work	3:10	.3	1:00	.1
Preparing Lectures	139:20	15.1	230:25	17.7
Media Selection	9:35	1.0	21:15	1.6
Background Reading	99:50	10.8	172:15	13.3
Collecting Materials	53:05	5.7	35:55	2.8
Field Trips	7:00	.8	0	0
Exams	89:05	9.6	130:05	10.0
Other	2:35	.3	2:00	.2
TOTAL	927:30	100.0%	1298:35	100.0%
Mean/Class	132:30		185:30	
Mean/Class per week	9:08		12:38	

NOTE: These figures represent 7 classes in each group. The median small class size was 15. The median large class size was 42.

It is interesting that the differences in relative amounts of time spent are so small. These small differences suggest that the teachers in our samples probably tend to approach teaching small classes and large classes in the same way. (One might speculate that teachers do a better job of lecturing in their large classes since they spend more time preparing and reading for them.)

Table 4 summarized the class activity data. The total frequency columns present little usable information. Due to the within-teacher design it is reasonable to assume that each teacher injected his/her own response bias into each sample. The % column presents relative frequencies of in-class activities. These relative frequencies can then be compared between samples. Examination of the table reveals few differences in relative frequencies of activities. Media seems to be more frequently used in large classes. The variety of activities in both large and small classes seems to be equal. Again, these data indicate few differences between what happens in large classes and small classes.

Both students and teachers evaluated each course by filling out parallel course rating forms. The 45 item form (plus one open ended question) can be divided into two parts. The first 40 items are more specific questions which look at different aspects of the particular course. The last five items form a "core" which more readily allows comparison between courses and instructors. According to Doyle (1975) it is not desirable to compare results from different faculty members on items like the first 40. It is quite reasonable to compare results on

TABLE 4
SUMMARY OF ACTIVITIES IN CLASSES

ACTIVITY	SMALL CLASSES Total Frequency	%	LARGE CLASSES Total Frequency	%
Lecturing	128	20.6	175	22.5
Use of Programmed Inst.	36	5.8	52	6.7
Lab Work	18	2.9	17	2.2
Small Group Activities	47	7.6	80	10.3
Large Group Activities	140	22.5	152	19.6
Individualized Instruction	81	13.0	92	11.8
Film Loop	1	.2	---	-----
Movies	10	1.6	20	2.6
Slides	1	.2	12	1.5
Filmstrips	5	.8	27	3.5
Videotape	4	.6	4	.5
Audiotape	12	1.9	24	3.1
Simulation Game	20	3.2	12	1.5
Overhead Transparencies	39	6.3	43	5.5
Field Trip	1	.5	5	.6
Evaluative Activities	19	3.0	25	3.4
Field Work	15	2.4	---	-----
Student Presentations	8	1.3	---	-----
Mediated Lecture	26	4.2	---	-----
Guest Lecturer	---	-----	2	.3
Records with Books	---	-----	3	.4
Questionnaire & Surveys	---	-----	7	.9
Music	7	1.1	19	2.4
Illustrations	---	-----	2	.3
Text Analysis	2	.3	---	-----
Map Work	---	-----	3	.4
TOTAL %		100.0		100.0

Different activities used --

Small Classes 21 Large Classes 21

the core items. Following Doyle's advice, we are not comparing results from different faculty on items 1-40. That data will be useful to us in designing and implementing a study to be done in the fall of 1975.

Table 5 presents mean responses from students and teachers to the core items from large and small classes. A response of 2 would be slightly negative. A response of 3 would be slightly positive. So it can be seen that most responses tend to be around the mid-point of the response scale. It appears that students feel that their teacher motivates them more in a small class. Also, students rate small courses slightly higher than large courses. It is interesting that the teachers responded less positive to their small classes on the first three questions. Once again, class size does not seem to have a large and/or consistent effect on student or teacher evaluation of a course.

Table 6 presents some correlation coefficients for the course evaluation data. It seems reasonable to expect that students' responses and teachers' responses for the same course should correlate quite well. The data in the table were computed by calculating the indicated correlation coefficients within each class or for each teacher; then those correlation coefficients were averaged. Given our sample of seven teachers, a variety of class sizes and the descriptive limitations of the design, this statistical procedure seems reasonable for indicating trends or patterns in the data. Table 6 reveals that the correlation between student rating of a teacher in a small class and student rating of the same teacher in a large class is greater than the correlation between student and teacher ratings for the same class. The

TABLE 5
MEAN RESPONSES TO CORE ITEMS ON COURSE EVALUATION FORM

ITEM	MEAN RESPONSE*			
	Students		Teachers	
	Large Class	Small Class	Large Class	Small Class
41. Satisfaction with accomplishments	2.78	3.07	2.57	2.28
42. Instructor motivates me	2.54	3.02	3.00	2.71
43. Interesting and stimulating assignments	2.42	2.28	2.80	2.60
44. Overall best course	2.21	2.55	2.00	2.67
45. Overall best teacher	2.56	2.33	2.50	2.50
ALL FIVE ITEMS	2.50	2.65	2.57	2.55

*NOTE: Return rate of student evaluation forms was high (over 80%) in all classes. All no response or no opinion responses were excluded from computing means. Faculty response to the last two questions averaged 60%. Faculty response to the first three questions exceeded 90%.

TABLE 6
CORRELATIONS OF COURSE EVALUATION DATA

VARIABLE	MEAN CORRELATION*
Instructor rating with student rating	
Large Classes	.36***
Small Classes	.39
Student rating of small classes with student rating of large classes	.60
Teacher rating of small classes with teacher rating of large classes	.56**

*The mean Pearson-Product-Moment correlation was calculated from the responses to all 45 items on the evaluation form. All seven large and all seven small classes were included.

**Due to the limited range of the response scale and the smallness of the sample of instructors, this correlation must be considered to be only an estimate. Visual examination of the data indicates a much stronger relationship than this moderate coefficient indicates.

***All four correlation coefficients are statistically significant ($p < .05$).

same is true of teacher ratings of her/his two classes compared to teacher and student ratings of the same class. This finding is of interest in that the high correlations of teacher ratings across class size and of the student ratings of the same teacher across class size would seem to indicate that teachers are doing very similar things in both their large classes and small classes.

Reading the teacher's log provides a variety of information. In addition to the data for the control variables discussed earlier, they provide a "sense of being" to each class. Each teacher also has some perceptions on the effects of class size. In order to preserve some of the flavor of these teacher responses, we have paraphrased what appeared to be interesting, relevant and general sorts of comments from each log. These log summaries are presented in Table 7.

Each teacher's log summary is somewhat analagous to a case study report. Examination of Table 7 yields a "sense" of the class size variable which is consistent with the other findings presented here. Namely, there are few systematic differences between large and small classes. Most teachers feel large classes require more time and effort--especially in preparation for class and in correction of student work. They also feel that teaching a small class might be a somewhat more personal experience. From reading the logs and the summaries, it is impossible to detect any consistent differences within the teachers in their approach to teaching a small class or a large class. Once again it appears that class size itself is not a significant variable in determining what happens in a course. In fact most teachers agree that class

TABLE 7
SUMMARIES OF TEACHER LOGS

NOTE: Entries in this table are simply summary statements taken or paraphrased from the logs. Each log averaged 12 pages per class so obviously much has been left out, but these summary entries provide a "case study" flavor of what is there.

TEACHER A:

Feelings that class size is irrelevant. The composition of students, sense of community, etc. in a class is much more important than size. Large class feels more vital, alive and personal than small. Better work from students in large class. Discussions are better in the large class as a result. Perhaps knowing students at the beginning of the course makes a difference.

TEACHER B:

Small class is very personal. Good group relations. Reach point of working together soon. Much work in lab school. Decrease in lecturing with progress into semester. Good student involvement. Talking with students is valuable. Student led discussions work well. Much sharing. Satisfying experience. Large class takes much time in getting organized--perception of time well spent. Four students opt for individualized work. Perceptions of much flexibility in course. Paper correcting becomes a major chore--need to be responsive to each paper, not just a grading machine. Learn a lot about students by correcting their work. Much interaction with students in and out of class. As semester progresses, students "perform" in class--generates much excitement and discussions. Feelings of a good semester.

TEACHER C:

Large class provides difficulties in getting all students to respond in a language course. Disparities in background of students is real and frustrating problem. Students concerned about background disparity too--especially when tests are soon to come. Students get into discussions. Good level of class responsiveness. Sense that background diversity much more of problem than class size.

TABLE 7 (continued)

TEACHER C (continued):

Small class is a cohesive and congenial group. Rapport stays high. Individual conferences with students of great importance. No other comments about size.

TEACHER D:

Small class approached with more informal approach. Unstructured initial meeting went well. More teacher awareness of non-verbal interaction in small class. Problem of attentive but inactive students. Role playing helped students to get to know one another better. Feelings of closeness to students in small class but class seems to maintain a reserved character. Basically things went well.
Large class starts off well. Less aware of eye contact and non-verbal cues than in small class. Feelings of impersonality and frustration over inability to respond to each student's behavior in classroom. Lectures well received. Problems in stimulating discussion. Role playing went well. Good feelings in class. Class outline quite closely parallels small section.

TEACHER E:

Used PSI model in large class. Small class much more traditional. Most students initially responded well to PSI approach. PSI reasonably easy to operate once it gets going. Writing so many test items is burdensome. Motivation variable in students is very important. Many students never come in. When given less importance in context of course and grading, lectures seem less stimulating. Class size seems totally irrelevant with PSI approach.

TEACHER F:

Small class operated through use of individualized learning packets. Initial enthusiastic response from students. Readily get into work. Much involvement in learning activities. Self-pacing seems comfortable. Deadlines do have to be enforced. Individual conferences help. Individual system works well but need more preliminary introduction for students. Must trust students a good deal. Self and peer evaluation tough to stimulate. Still have problems in dealing with individual problems in small individualized class.

TABLE 7 (continued)

TEACHER F (continued):

Large class takes much effort to get things going. Individual conferences helped but took much time. Did learn identity of individual students in conferences. Excitement about work on a major, current issue but feelings of uneasiness about the general nature of the assignment. Tough to evaluate subjective projects. Difficult to reinforce students of diverse skill levels simultaneously. Much effort required to meet variety of demands. Role conflicts in teaching (stimulator vs. evaluator simultaneously, etc.) all too apparent. Desire to be instructional manager and resource person, not just information giver. This desire counters too many student expectations. Difficult to meet needs of everyone.

TEACHER G:

Large class frequently uses lecture-discussion format. Concern that lecturing encourages student passivity. Student panels get active responding. Much preparation required. Reading papers takes much more time. Desires to use more media. Feelings of "getting behind" leads to more lecturing, less discussion. Students get too passive. Problems in diversity of writing abilities and motivation levels of students. Student panels restore discussion, but students must be forced to organize them. Doing all these things in a large class takes much time.
Small class able to "weed out" some low scorers on standardized test. Much lecturing augmented with media support. Difficulties in getting students to apply theories in practice. Very difficult to get consistently good writing from students. They are often "on different channel" from teacher. Procrastinators often need shoving. Lecture well received. Sometimes good discussion. There is a worrisome degree of plagiarism in both classes.

composition of students is a far more relevant variable in determining what happens in class and the effects of what happens.

CONCLUSIONS AND RECOMMENDATIONS

In actual practice at the College of Saint Benedict there seem to be few differences between large and small classes. Our sample, while not random, was truly selected in a manner which should not have biased our results. In fact the sample of teachers and of courses seems about as typical of the college as any sample of that size could be. Consequently, the results of this study have some definite implications for faculty productivity from the institution's point of view. In the courses for this study, the large sample teachers "taught" four units worth of work to 392 students in seven courses in about 1298 hourse. Those same teachers spent about 927 hours teaching only 92 students in their seven small classes. In other words the large classes were 400% more productive than the small classes in terms of student credit hour generation at a cost of only a 40% increase in faculty time spent. Obviously, large classes are incredibly more productive than small ones in the credit hour game. This finding indicates balancing faculty and student loads in terms of class size could indeed become a productive experience. The institution can afford to offer small classes so long as everyone teaches some large classes. Students can still feel the traditional personalness of the liberal arts college so long as

they will take at least one small class each semester. Our findings indicate this personalness can also be found in large classes, but attaching it to small classes maintains public relations appeal.

The question of quality of experiences for student remains. Our data indicates that there are not many differences qualitatively or quantitatively between large and small classes at the moment. Yet, we agree with Mouly's and McKeachie's assertions that large and small classes present different teaching opportunities and problems. While the variable of class size makes little difference at the moment, perhaps the variable could be a significant one in helping teachers cope with problems of developing competencies in students who enter college from a variety of backgrounds and with a variety of skills and abilities.

This rather optimistic though holds that the same variable, if appropriately controlled, could help improve both teaching/learning and productivity. It is that hope which leads us to the following recommendations:

1. The model for balancing class size enrollment definitely looks worth trying out. However, further study should be done to refine the model before implementing.

2. That further study should seek information on student perceptions on what should and could be done in classes of different sizes.

3. An action research model (see McGill and Horton, 1973) should be applied to the data in the study suggested above. Application of the action research model of working with faculty should generate a workable model for doing necessary faculty development to prepare teachers to use class size as a variable for increasing the effectiveness of teaching/learning in their courses. The use of the action research model should be especially useful in exploring the ramifications of the class size variable for competency based education at the College of Saint Benedict.

4. The balanced or multi-patterned class size model should then be implemented as the support can be provided for necessary faculty development.

To summarize and clarify these recommendations, we feel that balancing class size by having every student enroll in a multi-pattern of at least one small and one large class could be productive for the institution. The obvious need to balance faculty load accordingly must also be met. However, the qualitative benefits of this action for students will not be realized until faculty approach small classes as small classes and large classes as large classes. The necessary faculty development to assure this teaching differentiation should be done. Then, perhaps the institution can increase its productivity while simultaneously improving qualitative aspects of teaching/learning experience by manipulating the variable of class size which is easy to define and control.

APPENDICES

APPENDIX A: SAMPLE SUMMARY AND DAILY TIME FORMS

APPENDIX B: SAMPLE SUMMARY AND DAILY ACTIVITY FORMS

APPENDIX C: SAMPLE STUDENT EVALUATION OF COURSE QUESTIONNAIRE

APPENDIX D: SAMPLE TEACHER EVALUATION OF COURSE QUESTIONNAIRE

APPENDIX E: SAMPLE LOG FORM

APPENDIX A: SAMPLE SUMMARY AND DAILY TIME FORMS
COLLEGE OF SAINT BENEDICT: HILL PROJECT III
SUMMARY OF TIME SHEET

COURSE _____ NAME _____

In the spaces provided, please indicate how many hours or a proportion of time spent on each activity for this course. Please fill out the column for each cycle at the end of that cycle.

ACTIVITY / CYCLE	PRE	1	2	3	4	5	6	7	8	9	10	11	12	POS
Lecturing														
Correcting papers														
Media Presentation														
Talking with students														
Group activity														
Laboratory														
Preparing Lecture														
Media Selection														
Background Reading														
Collecting Materials														
Field Trip														
Exams														
Other														
Estimated Total														

SUMMARY OF TIME
DAILY WORK SHEET

COURSE _____

Indicate how many hours or a proportion of time spent on each activity for this course.

ACTIVITY	DAY 1	2	3	4	5	6
Lecturing						
Correcting Papers						
Media Presentation						
Talking with Students						
Group Activity						
Laboratory						
Preparing Lecture						
Media Selection						
Background Reading						
Collecting Materials						
Field Trip						
Other						

APPENDIX B: SAMPLE SUMMARY AND DAILY ACTIVITY FORMS
COLLEGE OF SAINT BENEDICT: HILL PROJECT III
SUMMARY OF ACTIVITIES

COURSE _____

In the space indicated, please check each activity done during each cycle. Place one check for each time you did the activity in class. For example, if you showed two films, make two checks. Please feel free to elaborate on any of your uses of these activities in your log.

ACTIVITY	CYCLE											
	1	2	3	4	5	6	7	8	9	10	11	12
Lecture												
Use Program Instruction												
Laboratory Exercise												
Small Group Activity												
Large Group Activity												
Individualized Instruction												
Movie												
Slide												
Filmstrip												
Videotape												
Audiotape												
Simulation-game												
Field Trip												
Other												

SUMMARY OF ACTIVITIES
DAILY WORK SHEET

COURSE _____

Place one check for each time you did the activity in class. For example, if you showed two films, make two checks

ACTIVITIES	DAY					
	1	2	3	4	5	6
Lecture						
Use Program Instruction						
Laboratory Exercise						
Small Group Activity						
Large Group Activity						
Individualized Instruction						
Movie						
Slide						
Filmstrip						
Videotape						
Audiotape						
Simulation-game						
Field Trip						
Other						

APPENDIX C: SAMPLE STUDENT EVALUATION OF COURSE QUESTIONNAIRE

CSB - HILL PROJECT

As part of a Hill Foundation Grant which is studying teaching activities on this campus, we are collecting data from this course. Your instructor has provided us with a great deal of information about the course. Now, we would like for you to cooperate with us and give us some information on your perceptions of the course. Your responses will not be used to evaluate you or your instructor. Your responses will be used to help us learn more about college level teaching/learning processes.

Please respond to the following questions honestly. Your responses will be kept confidential. In answering each of the forty-six (46) questions, please use the following rating scale:

STRONGLY DISAGREE	DISAGREE	AGREE	STRONGLY AGREE	NO RESPONSE
a	b	c	d	e

Please enter a response for each question.

Thank you.

1. My instructor is able to simplify difficult materials.
2. My instructor has an effective style of presentation.
3. My instructor makes learning easy and interesting.
4. This course supplies me with an effective range of challenges.
5. My instructor teaches one to value the viewpoint of others.
6. This course caused me to reconsider many of my former attitudes.
7. My instructor encourages student creativity.
8. Relationships among course topics are clearly explained.
9. My instructor recognizes when some students fail to comprehend.

10. My instructor's explanations and comments are always helpful.

11. My instructor suggests specific ways I can improve.

12. This course shows a sensitivity to individual interests/abilities.

13. A teacher/student partnership in learning is encouraged.

14. I feel free to ask questions in class.

15. Mutual respect is a concept practiced in this course.

16. The climate of this class is conducive to learning.

17. The course objectives allow me to know when I am making progress.

18. I was able to set and achieve some of my own goals.

19. The course content is consistent with my prior expectations.

20. This course contributes significantly to my professional growth.

21. The relationship of this course to my education is apparent.

22. This course gives me an excellent background for further study.

23. My instructor develops classroom discussion skillfully.

24. Challenging questions are raised for discussion.

25. Exams accurately assess what I have learned in this course.

26. Exams are creative and require original thought.

27. Exams are coordinated with major course objectives.

28. Grades are an accurate assessment of my knowledge in this course.

29. My instructor has a realistic definition of good performance.

30. The assigned reading is well integrated into this course.

31. Class projects are related to course goals and objectives.

32. Media in this course contributed significantly to my learning.

33. Team teaching is effectively used in this course.

34. Course topics are dealt with in sufficient depth.

35. The format of this course is appropriate to course purposes.

36. The teaching strategy used in this course is appropriate.

37. Assistance is always available throughout the lab sessions.

38. Lab assignments have instructional value.

39. The size of this class is appropriate to course objectives.

40. I highly recommend this course.

41. I am satisfied with my accomplishments in this course.

42. My instructor motivates me to do my best work.

43. Course assignments are interesting and stimulating.

44. Overall, this course is among the best I have ever taken.

45. Overall, this instructor is among the best teachers I have known.

We would like you to respond to the following open-ended question if you would. Your response will be held confidential, so please write what you honestly feel. (Use the back of the page, if necessary.)

46. What is your overall evaluation of this course?

APPENDIX D: SAMPLE TEACHER EVALUATION OF COURSE QUESTIONNAIRE

CSB - HILL PROJECT

As part of a Hill Foundation Grant which is studying teaching activities on this campus, we are collecting data from this course. Your students have provided us with their perceptions of certain aspects of the course. Now, we would like for you to cooperate with us and give us some information on your perceptions of the course. Your responses will be correlated with those of the students to help us learn more about college teaching/learning processes.

Please respond to the following questions honestly. Your responses will be kept confidential. In answering each of the forty-six (46) questions, please use the following rating scale:

STRONGLY DISAGREE	DISAGREE	AGREE	STRONGLY AGREE	NO RESPONSE
a	b	c	d	e

Please enter a response for each question.

Thank you.

1. I am able to simplify difficult materials.
2. I have an effective style of presentation.
3. I make learning easy and interesting.
4. This course supplies me with an effective range of challenges.
5. I teach students to value the viewpoints of others.
6. This class has caused me to reconsider many of my former attitudes.
7. I encourage student creativity.
8. Relationships among course topics are clearly explained.
9. I recognize when some students fail to comprehend.

10. My explanations and comments are always helpful.

11. I suggest specific ways that students can improve.

12. I adapt my courses to individual interests/abilities.

13. A teacher/student partnership in learning is encouraged.

14. I feel free to answer questions in class.

15. Mutual respect is a concept practiced in this course.

16. The climate of this class is conducive to learning.

17. The course objectives allow me to know when I am making progress in teaching.

18. I was able to improve either the quality of content of the course or the quality of my teaching of the course, and I was able to achieve any other teaching goals that I may have set for myself.

19. The course content is consistent with my prior expectations.

20. This course contributes significantly to my professional growth.

21. The relationship of this course to my "education" is apparent to me.

22. This course gives me an opportunity to share some material that I have seriously studied.

23. I develop classroom discussion skillfully.

24. Challenging questions are raised for discussion.

25. Exams accurately reflect the material, content, and depth in this course.

26. Exams are creative and require original thought.

27. Exams are coordinated with major course objectives.

28. The grades I give accurately assess a student's understanding of the course material.

29. I have a realistic definition of good performance.

30. The assigned reading is well integrated into this course.

31. Class projects are related to course goals and objectives.

32. Media in this class facilitated teaching significantly.

33. Course assignments are interesting and stimulating.

34. Team teaching is effectively used in this course.

35. Course topics are dealt with in sufficient depth.

36. The format of this course is appropriate to course purposes.

37. The teaching strategy used in this course is appropriate.

38. Assistance is always available throughout lab sessions.

39. Lab assignments have instructional value.

40. The size of this class is appropriate to course objectives.

41. I highly recommend this course.

42. I am satisfied with my "teaching" of this course.

43. I motivate students to do their best work.

44. Overall, this course is among the best I have ever given.

45. Overall, this class is among the best I have ever known.

We would like you to respond to the following open-ended question if you would. Your response will be held confidential, so please write what you honestly feel. (Use the back of the page, if necessary.)

46. What is your overall evaluation of this course?

APPENDIX E: SAMPLE LOG FORM

COURSE _____

Log: to be used as a diary or journal of what you did with respect to course. Please date entries. Please make at least one entry per cycle. Please up-date summary once per cycle. In this log please indicate your reactions to what you have done, your perceptions of student response to what has happened, and your comments on time and effort involved. Entries should be honest and not necessarily lengthy.

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